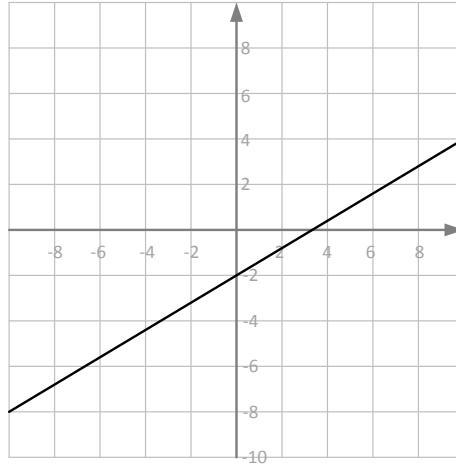


## Maths Intervention: Gradient of a Straight Line Graph.

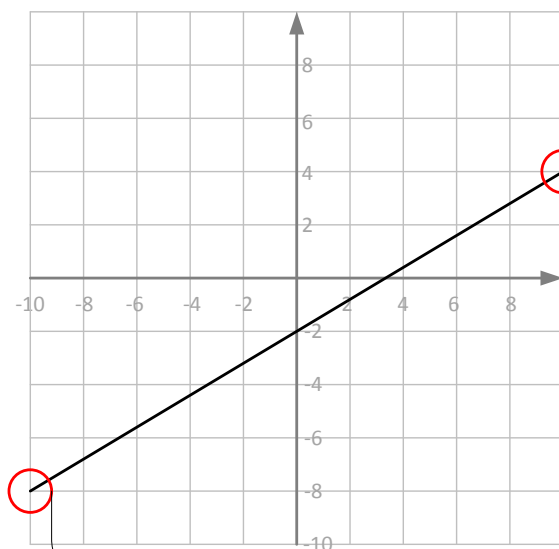
A graph records continuous data which is either measured or calculated. In mathematics, we usually calculate this data. Continuous data cannot be counted.



Above is an example of a straight line graph. We need to find the equation of this graph. The equation of a straight line graph always takes the form:  $y = mx + c$  where  $y$  is the  $y$  co-ordinate,  $m$  is the gradient,  $x$  is the  $x$  co-ordinate and  $c$  is the intercept.

There are four stages in finding the equation of this graph.

### (1) Find the co-ordinates of two points on the graph.



This is the left most point that I have selected hence this will be called point 1. Consequently, the  $x$  and  $y$  co-ordinates will be called  $x_1$  and  $y_1$ .

This is point two as it is the right hand point that I have selected. The  $x$  and  $y$  co-ordinates should be called  $x_2$  and  $y_2$ .

I have searched the graph to find two points that I have highlighted here. These points are highlighted because they are where the graph runs through the intersection of grid lines.

You need to record these points as:

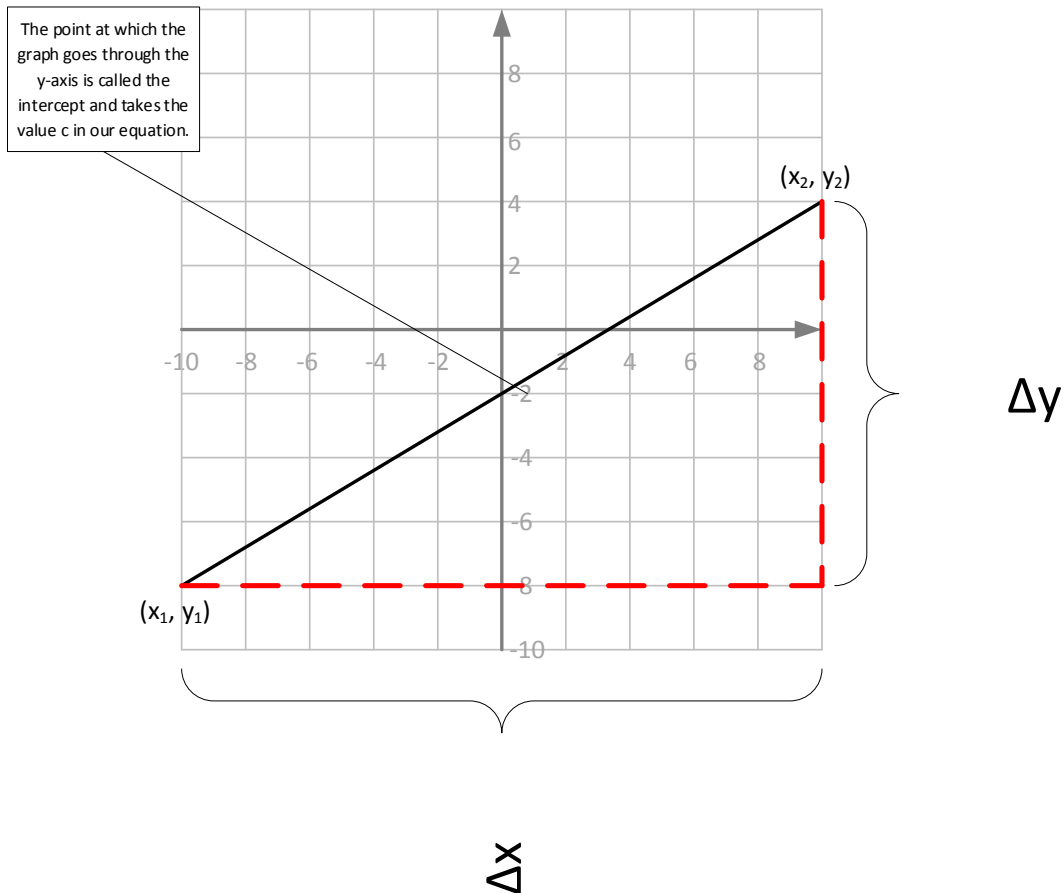
$$x_1 = -10$$

$$y_1 = -8$$

$$x_2 = 10$$

$$y_2 = 4$$

**(2) Calculate the gradient, m.**



$$m = \frac{\Delta y}{\Delta x} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{4 - (-8)}{10 - (-10)} = \frac{12}{20} = \frac{3}{5} = 0.6$$

**(3) Calculate the Intercept.**

The intercept is the place where the graph crosses the y-axis. On the graph above, you can see that this is at  $y=-2$ . Consequently, the intercept is -2.

**(4) Write down the equation of the graph.**

Straight line graphs have the equation,  $y=mx + c$ . You need to slot in the value of m, the gradient, which in this case is 0.6. The intercept goes where the c is. In this case, this is -2.

**$y=0.6x - 2$  is the equation of this graph.**

Use the method outlined to calculate the equations of the following graphs:

